of the apparatus of Otto von Guericke, Galileo and Volta. Passing on to the technological group, one notices the original lithographic press invented by Senefelder in 1797, and reproductions of Hargreaves's spinning jenny and of the first Jacquard loom. The chemical section is of special interest. There are four completely equipped laboratories of different epochs—an alchemist's laboratory (Fig. 3), with portraits of Albertus Magnus, Paracelsus, Agricola, Van Helmont and other investigators of the sixteenth and seventeenth centuries; an eighteenth-century laboratory; Liebig's laboratory as installed at Giessen in 1839; and, lastly, a modern laboratory illustrating the latest developments of chemical apparatus.

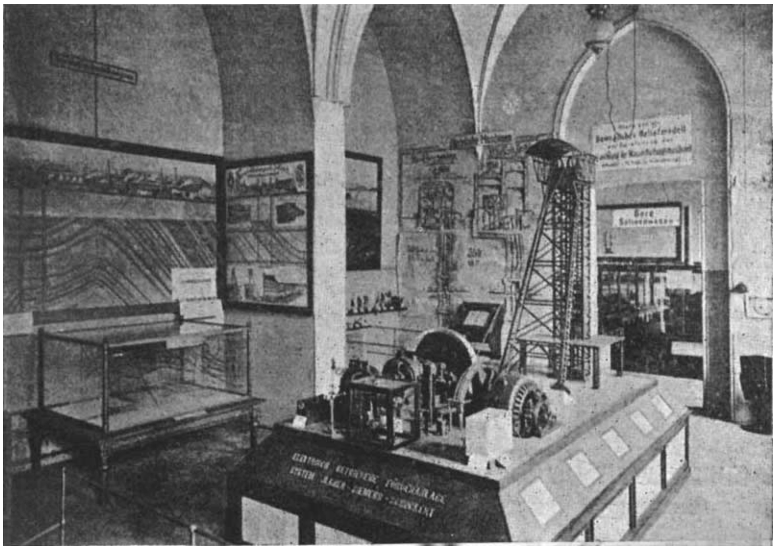

FIG. 2.—Model of electric winding plant.

The Court of Honour contains portraits in oils of Josef von Fraunhofer (1787–1826), K. F. Gauss (1777–1855), G. W. Leibniz (1646–1716), Otto von Guericke (1602–86), and Justus von Liebig (1803–75); and busts of Werner von Siemens (1816–92), Alfred Krupp (1812–87), Robert Mayer (1814–78), Hermann von Helmholtz (1821–94), Robert Bunsen (1811–99), and Henne Gensfleisch, known as Gutenberg (died 1468). There is also a collection of medals of scientific interest, including the Bessemer Gold Medal of the Iron and Steel Institute, and other medals awarded by British societies. Framed on the walls is a collection of historical documents, letters of Ampère, Berzelius, Faraday, Ohm and others. There is also a volume recording in chronological order the gifts received by the museum from all parts of the world.

The museum is keenly appreciated. The number of visitors averages 3000 on Sundays and 1000 on week-days. The detailed information given on the labels describing the objects has been compiled with scrupulous care, and adds greatly to the educational value of the collections. Huxley's definition of a museum was that it is a consultative library of objects. The German Museum is a consultative library for the engineer and the man of science, and it is something more. It is an effective agency for the enlightenment and education of the masses.

BENNETT H. BROUGH.

THE NORTH-WEST PASSAGE.[1]

STRICTLY speaking, the north-west passage was accomplished in 1847, when Franklin and his men, retreating from their abandoned ships to the north-west of King William Land, passed through Simpson Strait to the mouth of the Great Fish River, and so crossed the tracks of Dease and Simpson, who in 1839 had reached Castor and Pollux Bay from the west. The existence of channels at least continuous, and possibly navigable, from east to west was thus proved. Later, in 1853, McClure and his men, abandoning the *Investigator* in Mercy Bay, Banks Land, which point she had reached from the Pacific, retreated to the ships of Belcher's squadron, then wintering on the south-east of Melville Island, and ultimately reached home. This was the first party to complete the traverse of the American Arctic regions from ocean to ocean. Technically, McClure did the north-west passage, but he proved at the same time that his route was quite impracticable. The *Enterprise* under Collinson, the *Investigator's* companion ship, did more towards the discovery of the passage by reaching Cambridge Bay from the west. Consequently, the only part untraversed by a ship was from the north of King William Land to

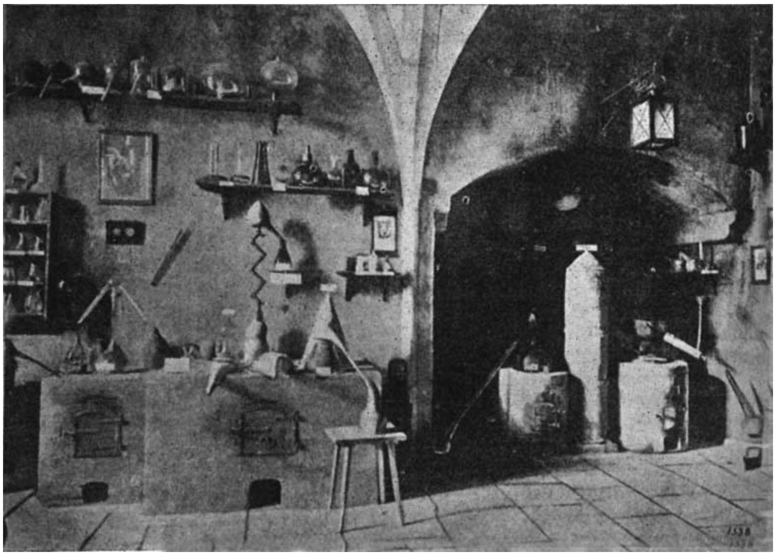

FIG. 3.—An alchemist's laboratory of the sixteenth century.

---

[1] "The North-West Passage." Being a Record of a Voyage of Exploration of the Ship *Gjöa*, 1903–7. By Roald Amundsen; with a Supplement by Lieut. Hansen. 2 vols. Pp. xiii+335 and pp. ix+397; illustrated. (London: A. Constable and Co., Ltd., 1908.) Price 31*s*. 6*d*. net.

the south of Victoria Land. A link of only some 200 miles (by the most direct channels) was all that remained to be forged when Amundsen planned and equipped his expedition in the *Gjöa*. But these facts cannot detract from the interest of the two volumes before us; the length of the *Gjöa's* voyage, no less than its historical importance, justifies the many pages.

There is no doubt that Amundsen's expedition will live in the annals of polar exploration in virtue of the accomplishment of the north-west passage; but that was only its secondary aim. "Our first and foremost task was to obtain exact data as to the Magnetic Pole," says Amundsen, and he repeats it several times. It had long been his ambition to navigate the north-west passage, but with a praiseworthy self-denial he compelled himself to keep the fulfilment of this feat of navigation subordinate to his scientific researches in magnetism. And yet in perusing the pages of the book one feels that the adventurous spirit of the Norseman was kept in check with difficulty; the desire to accomplish the passage was uppermost in his mind, and when once the greater part of the magnetic work was behind him his hearty enthusiasm seems to have been redoubled. However, in spite of this, Amundsen retained the *Gjöa* for nineteen months in winter quarters on the south-east of King William Land so that he could fulfil his programme of magnetic work, and this notwithstanding the fact that he saw open water ahead, and in all probability no obstacle in his road to the Pacific. That was an exhibition of devotion to scientific work in face of the greater fascination of an adventurous voyage which is most commendable and by no means common in polar exploration.

The *Gjöa*—a vessel of only forty-seven tons—left Christiania in 1903, and traversing Lancaster Sound and Barrow Strait reached Peel Sound. Amundsen was fortunate in finding Peel Sound open, as Franklin did in 1846 (but not so M'Clintock in 1858), and encountering no difficulties he sailed down Franklin Strait and entered Ross Strait to the east of King William Land. Here he was in virgin waters, for although M'Clintock had sledged down this strait in 1858, the *Erebus* and the *Terror* had passed to the west of King William Land in ignorance that there was a passage to the east. It was Rae who discovered the insularity of that land, and he held the opinion —afterwards shared by M'Clintock—that the only navigable passage was along its eastern and southern coasts. The ice pressing southward through Victoria Strait, narrow and encumbered with islands as it is, must always prove as insuperable an obstacle as it did to the *Erebus* and the *Terror*. Amundsen had reason to congratulate himself on following Rae's advice in this matter. Passing along Rae Strait the *Gjöa* went into winter quarters in September in a snug little harbour on the south-east of King William Land, since christened Gjöa Haven. The situation admirably suited the requirements of the work, which, the author explains, demanded such a distance from the magnetic pole that the inclination would be about 89°. From this base frequent excursions were made in all directions, Amundsen himself sledging on one occasion northward as far as the locality of the magnetic pole in Boothia Felix. By his observations he proved the truth of the theory that the magnetic pole has not a stationary position, but, on the contrary, is in continual movement within certain limits.

During April, May, and June, 1905, Lieutenant Hansen, accompanied by Ristvedt, made a sledge journey to Victoria Land, and succeeded in charting, as far as 72° N., the western shores of M'Clintock Channel, the supposed breadth of which he found had been much exaggerated. The new coast was named King Haakon VII. Coast. In addition, the "land seen by Rae" in Victoria Strait, which proved to be a group of many islands, was charted, though the work seems to have been done somewhat roughly. These surveys included all the topographical work of the expedition; nowhere else did the explorers touch quite new land. In August, 1905, the westward journey was resumed, and after some tortuous navigation through an island group in the north of Queen Maud Sea, Cambridge Bay was reached—the "farthest east" of Collinson's *Enterprise*. Thence onwards until King Point was made navigation was relatively simple, but at that point the *Gjöa* was stopped by ice, and compelled to pass a third winter. In the summer following she reached Nome City, and ultimately San Francisco, where she now lies, waiting, we understand, for the completion of the Panama Canal to return to Europe.

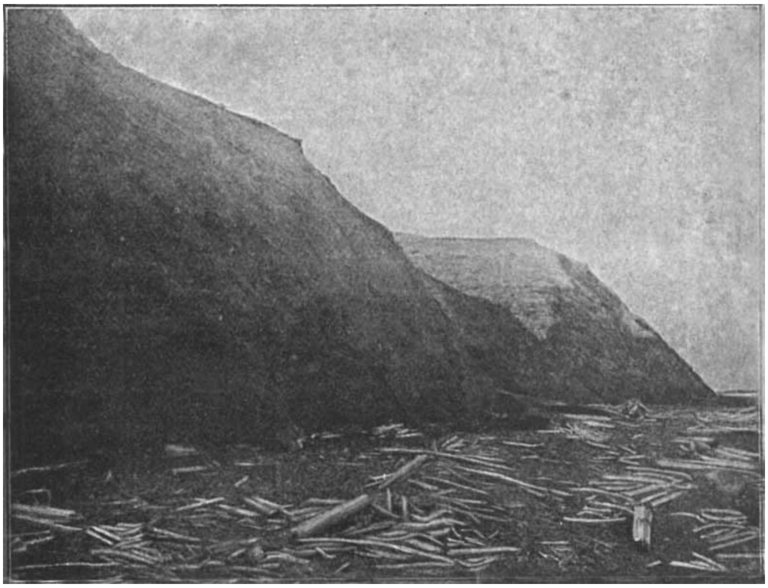

FIG. 1.—King Point. Shore strewn with Driftwood. From "The North-West Passage.

Amundsen thus accomplished the north-west passage, and, moreover, found a route that would probably be practicable for a small ship in any year if only Franklin Strait could once be reached from the east. The greatest difficulty in the whole passage lies in entering Franklin Strait, for Peel Sound and Bellot Strait, both of which Amundsen found open, may just as likely be blocked with pack-ice, as M'Clintock found them. Neither Ross nor Rae Straits appear to give much trouble, though in thick weather navigation in the vicinity of the magnetic pole must be, as the *Gjöa* found it, somewhat hazardous. The Esquimaux insist that Simpson Strait breaks up every year, and while Queen Maud

Sea probably is seldom navigable, the passage through Palander or Markham Straits, though intricate, is possible; three fathoms was the shoalest water found.

Except for the work in Victoria Strait and M'Clintock Channel, the voyage can scarcely be called one of exploration. The greater part of the route was relatively well known and charted. The expedition was never absolutely out of touch with the civilised world. Even at King William Land they got a mail by Esquimaux from Cape Fullerton, Hudson Bay, while at King Point they were in the company of whalers, missionaries, and policemen. During that winter Amundsen made a journey to Eagle City to get into cable communication with Europe. The main scientific work, magnetism, was successfully carried out, and a good series of meteorological observations were taken, at least in winter quarters. Lindström, the cook, was an enthusiastic collector of plants and animals, but, though one of the party was a geologist, we do not gather that geological observations and collections were made, except a few fossils at Boothia Felix and King William Land. That is a pity in view of the many opportunities that must have occurred during a voyage practically always within touch of land. Nor do we gather that any soundings were taken other than those essential for the navigation of the *Gjöa*; certainly none are indicated on the outline maps which accompany the volume. However, with regard to the Esquimaux encountered, very full information is given. The first two winters were passed in the company of the little-known Nechilli tribe. They appear to be one of the few tribes of Esquimaux who fortunately have had little or no contact with white men, though it was from members of this tribe that Rae got the news of Franklin's fate.

Amundsen tells his story in a lucid, interesting style, and, though the book would not lose by condensation in places, it is singularly free from the trivialities with which such volumes are often loaded. But an appendix of scientific results would have given more permanent value to these volumes.

One rather serious error on p. 59 should be mentioned. The author speaks of passing through Bellot Strait when he evidently only passed by the end of it.

A very full and accurate index is provided.

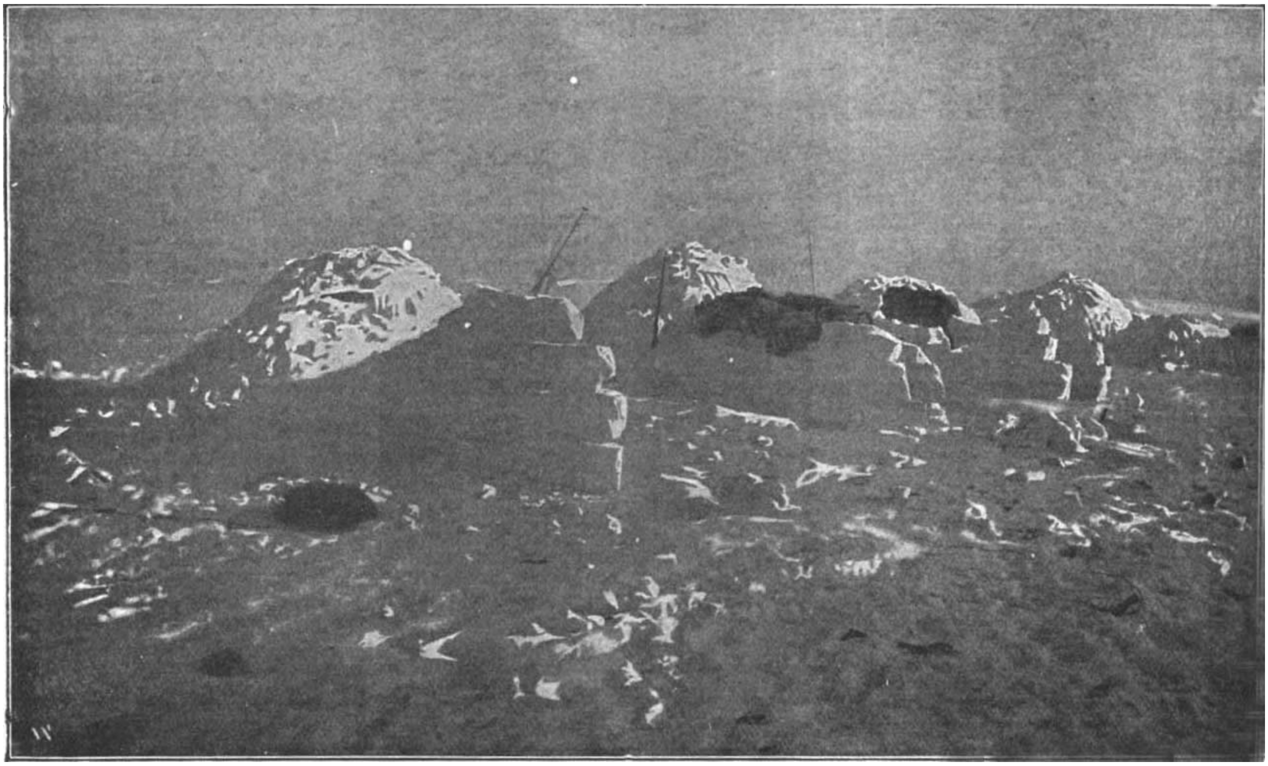

FIG. 2.—A Eskimo Camp in Winter Time. (Photograph taken at midnight.) From "The North-West Passage.

THE REPORT OF THE ROYAL COMMISSION ON THE CARE AND CONTROL OF THE FEEBLE-MINDED.

TO whatever criticisms this report may be subjected it cannot truthfully be characterised as either pusillanimous or incomplete. It is to the credit of the members of the commission that they have searched so thoroughly for their data and so fearlessly faced the numerous difficulties which the evidence presented to them. As a whole the report is broad-minded, eminently practical in its adjustment to the necessities of the situation, and conceived at once in a humanitarian and utilitarian spirit. Whether it is in advance of national ideas remains to be seen by the manner in which the legislature is prepared to deal with it.

The report necessarily opens up matter of great scientific interest; but the commissioners, perhaps wisely, have contented themselves with deducing from a mass of scientific evidence only such conclusions as bear upon the practical issues under their consideration. On the momentous question of the origin of mental defect, they remark somewhat plaintively (vol. viii., p. 179), "we found it practically impossible, and deemed it undesirable, to exclude from considera-